UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,545	10/18/2005	Olivier Riu	Serie 6186	1854

40582 7590 04/30/2008

AIR LIQUIDE
Intellectual Property
2700 POST OAK BOULEVARD, SUITE 1800
HOUSTON, TX 77056

EXAMINER	
GREENE, JASON M	

ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
04/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,545	RIU ET AL.	
	Examiner	Art Unit	
	Jason M. Greene	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-19,24,25 and 30-32* is/are rejected.

7)☒ Claim(s) *20-23 and 26-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 October 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/18/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.84(u)(1) and (2) because the view numbers are not larger than the numbers used as reference characters and because they are not preceded by the abbreviation "FIG.". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claims

2. With regard to claim 17, the Examiner suggests Applicants rewrite the phrase "a both" in line 5 as "both a" to correct an apparent typographical error.

3. With regard to claims 18 and 25, the Examiner suggests Applicants rewrite the word "polymides" in lines 3 as "polyimides" to correct an apparent typographical error.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Pinnau et al. (US 5,670,051).

Pinnau et al. discloses a method for separating propylene from propane from within a gas mixture comprising contacting a gas mixture with a first membrane, wherein the gas mixture comprises propylene and propane, obtaining both a propylene enriched permeate and a propane enriched retentate through the selective permeation, by the first membrane, of propylene with respect to propane, and decreasing the propylene

concentration of the permeate in the first membrane with a first sweeping gas (see col. 12, lines 43-44), wherein the membrane comprises a polymer in col. 5, line 7 to col. 8, line 8 and col. 12, lines 38-44.

6. Claims 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Friesen et al. (US 5,611,842).

Friesen et al. '842 discloses a method for separating propylene from propane from within a gas mixture comprising contacting a gas mixture with a first membrane, wherein the gas mixture comprises propylene and propane, obtaining both a propylene enriched permeate and a propane enriched retentate through the selective permeation, by the first membrane, of propylene with respect to propane, and decreasing the propylene concentration of the permeate in the first membrane with a first sweeping, wherein the membrane comprises a polymer in Figs. 1-4 and col. 2, line 48 to col. 11, line 48.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (US 6,271,319 B10 in view of Friesen et al. (US 5,753,008).

Baker et al. discloses a method for separating propylene from propane from within a gas mixture comprising contacting a gas mixture (109) with a first membrane (110), wherein the gas mixture comprises propylene and propane, obtaining both a propylene enriched permeate (112) and a propane enriched retentate (111) through the selective permeation, by the first membrane, of propylene with respect to propane, wherein the membrane comprises a polyimide or polyphenylene oxide polymer in Fig. 1 and col. 5, line 7 to col. 10, line 65

Baker et al. does not disclose decreasing the propylene concentration of the permeate in the first membrane with a first sweeping, but Friesen et al. '008 discloses a similar method comprising using a sweep gas on the permeate side of the membrane in col. 7, lines 4-26.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sweep gas of Friesen et al. '088 into the method of Baker et al. to increase the driving force across the membrane and the flux of propylene through the membrane.

9. Claims 24, 25, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (US 6,271,319 B10 in view of Friesen et al. (US 5,753,008).

With regard to claims 24, 25 and 30, Baker et al. discloses a method for the polymerization of polypropylene comprising performing a polymerization of propylene (103), recovering an effluent (104) from the polymerization comprising polypropylene, propane and propylene, treating (105) the effluent to produce a solid effluent (106) and a gaseous effluent (107), wherein the solid effluent comprises polypropylene and the gaseous effluent comprises propane and propylene, treating (110) at least part (109) of the gaseous effluent to separate the propylene from the propane, wherein the treating the gaseous effluent comprises contacting at least part of the gaseous effluent with a first membrane, obtaining both a propylene enriched permeate (112) and a propane enriched retentate (111) through the selective permeation of propylene with respect to propane, wherein the permeation is carried out by the first membrane, and introducing (112,113) the propylene enriched permeate to the polymerization of propylene, wherein the membrane comprises a polyimide, polyphenylene oxide or a perfluoropolymer, and wherein the polymerization of polypropylene comprises a copolymerization (see col. 5, lines 1-15 and 47-52) of polypropylene in Fig. 1 and col. 5, line 7 to col. 10, line 65

Baker et al. does not disclose decreasing the propylene concentration of the permeate in the first membrane with a first sweeping, but Friesen et al. '008 discloses a similar method comprising using a sweep gas on the permeate side of the membrane in col. 7, lines 4-26.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sweep gas of Friesen et al. '088 into the method

of Baker et al. to increase the driving force across the membrane and the flux of propylene through the membrane.

With regard to claim 32, Baker et al. discloses using multiple polymerization reactors, including in parallel arrangements in col. 5, lines 45-52. Baker et al. does not explicitly recite the effluents from each reactor being passed to a separate treatment stages to produce the solid and gaseous effluents, and subsequently mixing the gaseous effluents prior to the membrane separation step. However one of ordinary skill in the art at the time the invention was made would have recognized that a separate effluent separation stage could be provided for each individual polymerization reactor to allow the production or polypropylene to continue while one effluent separator is out of service for maintenance.

10. Claims 19 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (US 6,271,319 B10 and Friesen et al. (US 5,753,008), and further in view of Rao et al. (5,507,856).

Friesen et al. '008 teaches the sweep gas comprising a hydrocarbon including propane in col. 7, lines 4-26, but does not explicitly mention ethylene.

Rao et al. teaches a similar method wherein the sweep gas is ethylene in col. 2, lines 32-39.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ethylene sweep gas of Rao et al. into the method of Baker et al. and Friesen et al. '008 in that such is an alternate sweep gas in the art.

Allowable Subject Matter

11. Claims 20-23 and 26-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

Baker et al. teaches the gas mixture further comprising hydrogen, wherein the hydrogen is permeated through the first membrane along with propylene to form the permeate stream which is reintroduced into the polymerization reactor in col. 14, line 64 to col. 15, line 5.

The prior art made of record does not teach or fairly suggest the methods of claims 17 or 24 further comprising pretreating the gaseous effluent mixture prior to the selective permeation, the pretreating comprising contacting the gaseous effluent mixture with a second membrane and obtaining a hydrogen enriched permeate and a retentate enriched with propylene and propane by selective permeation with the second membrane.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Aittamaa et al., Vasileiadis et al., Herrera et al., Gottschlich et al., Steigelmann et al. '603, Steigelmann et al. '983 and Dembicki et al. references disclose similar methods.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (571) 272-1157. The examiner can normally be reached on Monday - Friday (9:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jason M. Greene
Primary Examiner
Art Unit 1797

/Jason M. Greene/
4/26/08

jmg
April 26, 2008